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10/675,220	09/30/2003	Samuil Shmuylovich	EMC03-17(03087)	9876

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EXAMINER

WAI, ERIC CHARLES

ART UNIT	PAPER NUMBER
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2195

MAIL DATE	DELIVERY MODE
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10/26/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/675,220

Applicant(s)

SHMUYLOVICH ET AL.

Examiner

Eric C. Wai

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.138(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/16/2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-21 and 23-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-21 and 23-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-6, 8-21, and 23-34 are presented for examination.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-6, 8-21, and 23-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. The following terms are not clearly understood:
 - i. Claim 1 recites, "assigning a store process of the plurality of store processes for the agent to use to perform the agent transaction based on the determined store process availability". It is unclear whether this assigning step assigns store processes to agents that have been identified as non-responding in the agent wait table.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2,8-9,12-17,23-24, and 27-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oliveira (US Pub No. US 2004/0186904 A1) in view of Sayan et al. (US PG Pub No. US 2002/0169820 A1 hereinafter Sayan).

6. Regarding claim 1, Oliveira teaches a method for processing information in a management application, the method comprising the steps of:

receiving load information from a plurality of processor, the load information indicating a relative processing load for respective processor in the plurality of processor ([0025], where in the utilization information is analyzed);

determining processor availability of the plurality of processor based on the received load information ([0025], wherein it is determined whether the processors have the capability to handle additional tasks);

receiving a store assignment request from an agent that has an agent transaction to perform with a processor ([0025], "new processing task"); and

assigning a processor of the plurality of processors for the agent to use to perform the agent transaction based on the determined processor availability ([0025], wherein the task is assigned to a specific processor that can handle the task).

7. Oliveira does not teach that the processors are store processes. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Oliveira's processors to use a store process. It is well known in the art that a store processes is equivalent to a node or a processor used to execute tasks or processes.

8. Oliveira does not teach that the store assignment request originates from an agent. Oliveira deals with load balancing of conference calls in a VOIP system. It would have been obvious to one of ordinary skill in the art that the system users that initiate the calls or tasks of Oliveira's system, is equivalent to the agents. Furthermore, one of ordinary skill can interpret the agents of Applicant's invention as programs or threads that make requests (agent transactions) to be executed.

9. Oliveira does not teach the step of identifying a non-available store condition when the load information is not within an acceptable threshold load factor range. However, Oliveira's system ensures that the processing of tasks does not cause overloading ([0026]). It would have been obvious to one of ordinary skill to identify a condition when all processors are overloaded (i.e. not within an acceptable threshold load factor range).

10. Oliveira also does not teach that during the non-available store condition, maintaining an agent wait table containing agent entries and identifying agents as non-responding when no store assignment requests have been received from those agents for a predetermined agent timeout period.

11. Sayan teaches a method using a pool of agents to handle client transactions ([0013]), where idle agent processes are terminated when such agents are idle for more than a predetermined period of time ([0143]).

12. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Oliveira to use agents to handle transactions and identify when such

agents are non-responsive. One would be motivated by the desire to make more efficient use of resources (Sayan [0012]) and recycle resources utilized by unresponsive agents.

13. Regarding claim 2, Oliveira teaches determining processor availability of the plurality of processors based on the received load information comprises:

for each processor of the plurality of processors:

i) if the load information for that processor is within an acceptable threshold load factor range, identifying that processor as an available processor within the plurality of processors ([0027] wherein a processor does not issue an alert to the controller to signal that it is overloaded); and

ii) if the load information for that processor is not within the acceptable threshold load factor range, identifying that processor as an unavailable processor within the plurality of processors ([0027] wherein a processor issues an alert to the controller to signal that it is overloaded).

14. Regarding claim 8, Oliveira teaches assigning a processor of the plurality of processors for the agent to use to perform the transaction based on the determined processor availability comprises:

determining if there is at least one processor of the plurality of processors that is identified as an available processor (Fig 3, 330), and if so:

i) assigning a processor of the plurality of processors that has the most favorable load information as a selected processor for use in processing the agent transaction for the agent (Fig 3, 340)

ii) forwarding a store assignment response identifying the selected processor to the agent providing the store assignment request (wherein it is inherent that some response must be sent to indicate the coupling of request to processor).

15. Regarding claim 9, Oliveira teaches repeating receiving load information, determining processor availability, receiving a store assignment request from an agent and assigning a processor such that, over time, assignment of processors to handle processing of agent transactions is load balanced across the plurality of processors based on the load information from the processors ([0007]).

16. Regarding claim 12, Oliveira and Sayan do not teach that the management application is a storage area network management application;

the store assignment requests are received from agent processes operating on host computer systems in the storage area network that collect management data on behalf of managed entities associated with the agent processes, the agent processes transferring the management data within agent transactions to processors to which they are assigned; and

the plurality of processors operate to process the agent transactions to store the management data into a management database on behalf of the plurality of agent processes.

17. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Oliveira for use in a storage area network management application. One would be motivated by the desire to extend the teachings of Oliveira for purposes of managing a storage area network.

18. Regarding claim 13, Oliveira teaches a method for processing information in a management application, the method comprising the steps of:

receiving an agent transaction to be processed in a processor, the agent transaction having an associated transaction weight ([0020], new processing task and [0025] wherein the new task requires a certain amount of processing capability);

calculating a current collective transaction weight of all agent transactions currently being processed in the processor ([0024], wherein the current CPU utilization include a variety of factors);

calculating a new collective transaction weight as a sum of the current collective transaction weight and the transaction weight of the agent transaction to be performed with a processor ([0026], wherein the amount of processing required to support the new task and the amount of processing capability of each processor is analyzed);

if the new collective transaction weight is not within an acceptable collective transaction weight threshold, then queuing the agent transaction in an agent transaction queue ([0026], wherein the task must be queued); and

if the new collective transaction weight is within an acceptable collective transaction weight threshold, then processing the agent transaction within the processor to convert management data in the agent transaction request into managed object data in a management database accessed by a management application ([0026], wherein the task is executed by the assigned processor).

19. Oliveira also does not teach the use of processors and agents transaction. Oliveira deals with load balancing of conference calls in a VOIP system. It would have been obvious to one of ordinary skill in the art that the system users that initiate the calls or tasks of Oliveira's system, is equivalent to the agents and that processors are equivalent to processors. Furthermore, one of ordinary skill can interpret the agents of Applicant's invention as programs or threads that make requests (agent transactions) to be executed or stored.

20. Regarding claim 14, Oliveira and Sayan do not explicitly teach selecting an agent transaction from the agent transaction queue to be processed by the processor that has an associated transaction weight that, when summed with the current collective transaction weight produces a new collective transaction weight that is within an acceptable collective transaction weight threshold; and removing the processed agent transaction from the agent transaction queue.

21. Oliveira makes no mention of how the system deals with requests when all processors are overloaded. It would have been obvious to one of ordinary skill in the art at the time of the invention to queue all pending requests in the order that they are received. One would be motivated by the desire to keep track of all requests that are pending. Furthermore, it would have been obvious to remove from the queue, the next pending task that could be processed by an available processor without overloading the system ([0026]).

22. Regarding claim 15, Oliveira teaches calculating load information based on current resource utilization within the processor (Fig 3, 320); and periodically providing the load information to a load manager process for use by the load manager process in making load balancing decisions for the assignment of processors for use in processing agent transactions on behalf of agent processes ([0007], "periodically polling the processors in regard to their current CPU load").

23. Regarding claims 16-17, 23-24, 27-30, they are the system claims of claims 1-2, 8-9, and 12-15 above. Therefore they are rejected for the same reasons as claims 1-2, 8-9, and 12-15 above.

24. Regarding claims 31-34, they are the system and computer program product claims of claims 1 and 13 above. Therefore they are rejected for the same reasons as claims 1 and 13 above.

25. Claims 3-6, and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oliveira (US Pub No. US 2004/0186904 A1) and Sayan et al. (US PG Pub No. US 2002/0169820 A1) in view of Brenner et al. (US Pat No. 6,658,449 hereinafter Brenner).

26. Regarding claim 3, Oliveira and Sayan do not teach that maintaining an agent wait table comprises; each agent in the agent wait table identifying corresponding wait times for agents that have supplied store assignment requests for processing an agents transaction with one of the plurality of the store processes.

27. Brenner teaches the use of a starvation load balancing technique that tracks waiting threads (col 8 lines 4-10). It would have been obvious to one of ordinary skill in the art at the time of the invention to include tracking each request according to its wait time. One would be motivated by the desire to ensure the requests are processed in a timely manner.

28. Regarding claim 4, Brenner teaches that if a wait time for an agent identified in an agent entry in the agent wait table exceeds an agent wait threshold, identifying that agent entry in the agent wait table as a starving agent entry (col 8 lines 14-16).

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29. Regarding claim 5, Oliveira, Sayan and Brenner teach assigning a processor of the plurality of processors for the agent to use to perform the transaction based on the determined processor availability comprises:

if there is at least one starving agent entry identified in the agent wait table, and if the store assignment request is received from an agent associated with a starving agent entry, and if there is at least one processor of the plurality of processors that is identified as an available processor (Brenner col 8 lines 16-19, wherein the dispatcher identifies starving threads), then:

i) assigning an available processor of the plurality of processors that has the most favorable load information as a selected processor for use in processing the agent transaction for the agent identified in the starving agent entry in the agent wait table (Oliveira [0025]); and

ii) forwarding a store assignment response identifying the selected processor to the agent providing the store assignment request corresponding to the starving agent entry in the agent wait table (Oliveira Fig 3, 340); and

iii) removing the starving agent entry from the agent wait table (Brenner, col 8 lines 16-19, wherein the thread is removed from the queue).

30. Regarding claim 6, Oliveira, Sayan and Brenner do not explicitly teach that assigning a processor of the plurality of processors for the agent to use to perform the transaction based on the determined processor availability comprises:

if there is at least one starving agent entry identified in the agent wait table and the store assignment request is received from an agent that is not associated with a starving agent entry, then:

i) updating the agent entry associated with the agent that provided the store assignment request in the agent wait table to indicate receipt of the store assignment request; and

ii) skipping assignment of an available processor to the agent that provided the store assignment request in order to wait for receipt of a store assignment request from an agent associated with a starving agent entry in the agent wait table.

31. However, it would have been obvious to one of ordinary skill in the art to include the updating of each agent entry upon receiving a new store assignment request and skipping assignments to agents not on the starvation list. One would be motivated by the desire to continually updated the wait table to track new requests and give priority to starving agents as taught by Brenner (col 8 lines 20-25).

32. Regarding claims 18-21, they are the system claims of claims 3-6 above. Therefore they are rejected for the same reasons as claims 3-6 above.

33. Claims 10-11 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oliveira (US Pub No. US 2004/0186904 A1) and Sayan (US PG Pub

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No. US 2002/0169820 A1), in view of Hejna, Jr. et al. (US Pat No. 5,287,508 hereinafter Hejna).

34. Regarding claim 10, Oliveira and Sayan do not teach assigning a processor of the plurality of store processes for the agent to use to perform the agent transaction based on the determined processor availability comprises:

after assignment of the processor for the agent to use, establishing a recently assigned agent condition associated with that processor;

on a successive iteration of assigning a processor, if the recently assigned agent condition associated with processor is still established, selecting a processor for processing the agent transaction other than the processor to which the recently assigned agent condition applies; and

clearing the recently assigned agent condition after a predetermined agent assignment interval has elapsed.

35. Hejna teaches processing scheduling techniques that maintains a process table to track resource usage. Processes may be given a lower priority if they have recently used the processor (col 1 lines 20-29).

36. It would have been obvious to one of ordinary skill in the art at the time of the invention to include establishing a recently assigned agent condition to ensure the equal distribution of resources to other agents.

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37. Regarding claim 11, Oliveira teaches that the load information received from the plurality of processor includes a current collective transaction weight of all currently assigned transactions for each processor ([0022], wherein the CPU utilization information can include the number of conferences or participants); and

the store assignment request received from the agent has an associated transaction weight of the agent transaction to be performed with a processor ([0026], wherein the amount of processing required to support the new task is determined);

and wherein assigning a processor of the plurality of processors for the agent to use to perform the agent transaction comprises:

for each available processor, calculating a new collective transaction weight as a sum of the current collective transaction weight and the transaction weight of the agent transaction to be performed with a processor ([0026], wherein the system determines whether the new task can be supported);

determining if there is at least one processor of the plurality of processors that has a new collective transaction weight that is within an acceptable collective transaction-weight ([0026], wherein the system determines whether the new task will overload the processor), and if so:

i) assigning a processor of the plurality of processors that has the new collective transaction weight that is within an acceptable collective transaction weight as a selected processor for use in processing the agent transaction for the agent ([0026], wherein the task is assigned); and

ii) forwarding a store assignment response identifying the selected processor to the agent providing the store assignment request ([0026], wherein an acknowledgement must be sent).

38. Regarding claims 25-26, they are the system claims of claims 10-11 above. Therefore they are rejected for the same reasons as claims 10-11 above.

Response to Arguments

39. Applicant's arguments with respect to claims 1-6, 8-21, and 23-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

40. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric C. Wai whose telephone number is 571-270-1012. The examiner can normally be reached on Mon-Thurs, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng - Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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